Hubbell Industrial Controls, Inc.

Electric Fire Pump Controllers

Specifications for *LXi* 1900 Controllers * Wye-Delta Open Transition Start * July 2002

The fire pump controller shall be factory assembled, wired, and tested as a unit assembly, shall conform to the requirements of the latest editions of NFPA-20 and NFPA-70, and shall be Listed/Approved by and bear the label of UL/FM. The controller shall be Hubbell-Lexington *LXi* 1900 equipped with *LXi* logic.

The controller shall be of the combined manual/automatic type and be furnished in a floor mounted drip-proof steel Type 2 enclosure with lifting eyes. The enclosure shall be red with a non-glare surface. The controller shall be for wye-delta open transition start and designed, tested, and marked for the rated horsepower and 3-phase voltage and frequency in a 40 degree C. ambient.

All electrical components shall be accessible from the front for maintenance and service. No components or component wiring shall be permitted on the door of the enclosure. The controller shall have a common operating handle for both the line isolating switch and the controller circuit breaker mounted in the enclosure flange. The minimum withstand rating for the fire pump controller shall be 150,000 amps RMS symmetrical at 200-600volts. The unit shall be Listed/ Approved with UL/FM as "Suitable For Use As Service Equipment".

The controller shall have separate and independent pressure settings with minimum run timing capable of a setting of 10 minutes. Settings of the pressures shall be established at the time of the field acceptance test. Provisions shall be included to allow manual or automatic shutdown in the field.

The controller shall have two sets of Form "C" contacts for Pump Running, Phase Reversal, Power/Phase Failure, and one set of Form "C" contacts for Trouble. The Trouble contacts shall be activated by the following conditions: Invalid Configuration Memory, Emergency Manual Start, Pump Running, Phase Failure, Phase Reversal, Overload, Locked Rotor, Fail-to-Start, and Lockout.

The controller shall be equipped with *LXi intelligent fire pump control system logic.* All firmware shall be non-volatile flash based CPLD (*complex-programmable logic device).* The boot-up time for the logic shall be 3 seconds or less. Controllers that do not boot-up and allow the pump to be started in 3 seconds or less are not acceptable. An RS232 serial port shall be supplied for downloading event history to a PC for analysis and printing.

The digital pressure readings and settings shall be displayed on the *LXi* LCD mounted on the enclosure flange. The LCD screen shall be 4 x 20 (4 lines of 20 characters) per screen, and the screens may be scrolled to give a total of 320 characters. The real time display shall give <u>simultaneous</u> 3-phase digital amps and volts for the pump power, and digital display for the system pressure. Controllers that do not simultaneously display digital 3-phase amps, line-to-line volt readings, and system pressure, are not acceptable.

The event alarm caches shall be compartmentalized, and no compartment shall over-ride any other compartment. The compartments allow for analysis of four types of information events without having to look through all events including those not related to a problem. Events shall be shown with Date and Time for each event occurrence:

1.   Events that have occurred during a pump idle period
2.   Events that occurred during the last start period
3.   Events that occurred during the last run period
4.   Events that occurred during the last stop period.

The LED displays shall be mounted on the enclosure flange and have an LED for the following, with provisions for five spare LED's to be available and programmable for other options or event displays.

1. Power Available	8. Phase Reversal	15. Remote Start
2. Low Suction	9. Overload	16. Start Timer/Accelerate
3. Pump Start Delay On	10. Local Manual Start	
4. Locked Rotor	11. Local Manual Stop	
5. Pressure Switch Start	12. Lockout On	
6. Emergency Manual Start	13. Run Timer On	
7. Fail to Start	14. Pump Running	

The LED displays shall be mounted on the enclosure flange and have an LED for the following:

Programming of the *LXi* logic shall be from the touch pad mounted on the enclosure flange. Programming shall be password protected so that only authorized personnel can change the logic functions. The fire pump controller shall be Model *LXi* 1900 equipped with *LXi* Logic as manufactured by Hubbell Industrial Controls, Inc.